

Soil Temperature Protocol - Diurnal Cycle Measurement Field Guide

Task

Measure soil and air temperature at least five times a day for two days.

What You Need

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| <input type="checkbox"/> <i>Diurnal Cycle Soil Temperature Data Sheet</i> | <input type="checkbox"/> Hammer (if soil is extra firm) |
| <input type="checkbox"/> Soil thermometer | <input type="checkbox"/> Watch |
| <input type="checkbox"/> Soil Thermometer spacers | <input type="checkbox"/> Pen or pencil |
| <input type="checkbox"/> 12 cm or longer nail marked at 5 cm, 7 cm, 10 cm and 12 cm from its point (if soil is not soft) | <input type="checkbox"/> Science Log |
| | <input type="checkbox"/> Thermometer (for current air temperature) |

In the Field

1. Fill in the top portion of the *Diurnal Cycle Soil Temperature Data Sheet*, choose your first sampling point and skip step 2.
2. Locate your sampling point 10 cm from your previous measurements (If soil is soft, skip to step 4).
3. Use the nail to make a pilot hole 5 cm deep for the thermometer. If the ground is extra firm and you have to use a hammer, make the hole 7 cm deep. Pull the nail out carefully, disturbing the soil as little as possible. Twisting as you pull may help. If the soil cracks or bulges up, offset 10 cm and try again.
4. Insert the thermometer through the longer spacer so that 7 cm of the thermometer extends below the bottom of the guide. The dial should be against the top of the spacer.
5. Gently push the thermometer into the soil.
6. Wait 2 minutes. Record the temperature and time in your Science Log.
7. Wait 1 minute. Record the temperature and time in your Science Log.
8. If the 2 readings are within 1.0° C of each other, record this value and the time on the *Diurnal Cycle Soil Temperature Data Sheet* for the current sample, 5 cm reading. If the 2 temperatures are not within 1.0° C, continue taking temperature readings at 1-minute intervals until 2 consecutive readings are within 1.0° C.
9. Remove the thermometer from the hole (If the soil is soft, skip step 10).

10. Use the nail to deepen the hole to 10 cm. If you have to use a hammer, deepen the hole to 12 cm.
11. Replace the long spacer with the short one so that 12 cm of the thermometer extends below the bottom of the spacer. Insert the thermometer in the same hole.
12. Wait 2 minutes. Record the temperature and time in your Science Log.
13. Wait 1 minute. Record the temperature and time in your Science Log.
14. If the 2 readings are within 1.0°C of each other, record this value and time on the *Diurnal Cycle Soil Temperature Data Sheet* for the current sample, 10 cm reading. If the 2 temperatures are not within 1.0°C , continue taking temperature readings at 1-minute intervals until 2 consecutive readings are within 1.0°C .
15. Read and record the current air temperature from the thermometer in the instrument shelter or following the *Current Temperature Protocol* in the *Atmosphere Chapter*.
16. Repeat steps 2-15 every 2 to 3 hours for at least 5 measurement times
17. The next day, repeat steps 2-16.

Figure SO-TE-2: Soil Temperature: Layout of Diurnal Observation

